

DEPARTMENT OF  
**ECOLOGY**  
State of Washington

**Final Technical Support Document  
for SGL Composites LLC PSD Permit 14-  
02, Amendment 2**

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## Publication and Contact Information

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**Proposed Technical Support Document  
for SGL Composites LLC PSD Permit 14-02,  
Amendment 2**

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Air Quality Program  
Washington State Department of Ecology  
Olympia, Washington

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# **1. Executive Summary**

The Washington Department of Ecology (Ecology) proposes to give a time extension of 18-months to the SGL Composites LLC (SGL) facility in Moses Lake, Washington, Prevention of Significant Deterioration (PSD) permit No. 14-02. This will be the second amendment to PSD No. 14-02.

Ecology's general air regulation describes construction time limitations in Chapter 173-400-730(5) Washington Administrative Code (WAC). The permittee has made a timely request to extend their construction time limitation as allowed in Chapter 173-400(5)(i). Ecology has reviewed SGL's request and is proposing to grant an 18-month extension for phase 2 that will run April 1, 2018, through September 30, 2019.

Ecology has determined that all regulatory requirements have been satisfied, and the time extension complies with the requirements for New Source Review (NSR) in the state of Washington.

## **2. Introduction**

This TSD addresses the issuance of a time extension amendment for PSD permit No. 14-02. PSD permit No. 14-02 was issued on April 13, 2015. SGL halted construction of Phase 2 (Line 6) on Saturday, September 23, 2016.

The PSD permitting requirements in Washington State are established in Title 40, Code of Federal Regulations (CFR) §52.21; and in the WAC 173-400-700 through 750. WAC 173-400-730(5) contains the requirements for Ecology to grant a time extension.

The project has been building lines, and the Best Available Control Technology (BACT) has not changed. Federal and state rules require PSD review of all new or modified air pollution sources that meet certain criteria in an attainment or unclassifiable area with the National Ambient Air Quality Standards (NAAQS). The objective of the PSD program is to prevent significant adverse environmental impact from emissions into the atmosphere by a proposed new major source, or major modification to an existing major source. The program limits degradation of air quality to that which is not considered “significant.” The existing PSD permit has met these requirements.

## 3. The Project

### 3.1. The site

SGL built an automotive carbon fiber facility that is located on 110 acres of land in Moses Lake, Washington (in Grant County). The site is within a Class II area that is in attainment or unclassified with regard to all pollutants regulated by the NAAQS and state air quality standards. The physical address is 8781 Randolph Road NE, Moses Lake, Washington. The property borders Stratford Road NE to the west, Randolph Road NE to the east, and is approximately one-half mile east of the Grant County International Airport, Township 20 N Range 28 E Section 22. The bounding Universal Transverse Mercator coordinates are NAD83 Zone 11, 326705/5231086, 327498/5231054, 327488/5230395, 326697/5230457.

A map of the facility is shown in Figure 1 below. The building on the far left is administrative and warehouse, the building labeled Lines 1–2 and Lines 3–4 are existing structures and operational. The building labeled Lines 5–6 is under construction with Line 5 operational. The proposed new buildings are labeled New Warehouse, Lines 7–8, and Lines 9–10. Construction was halted on Line 6 on September 23, 2016. Ecology received SGL's request for a time extension on February 2, 2018.

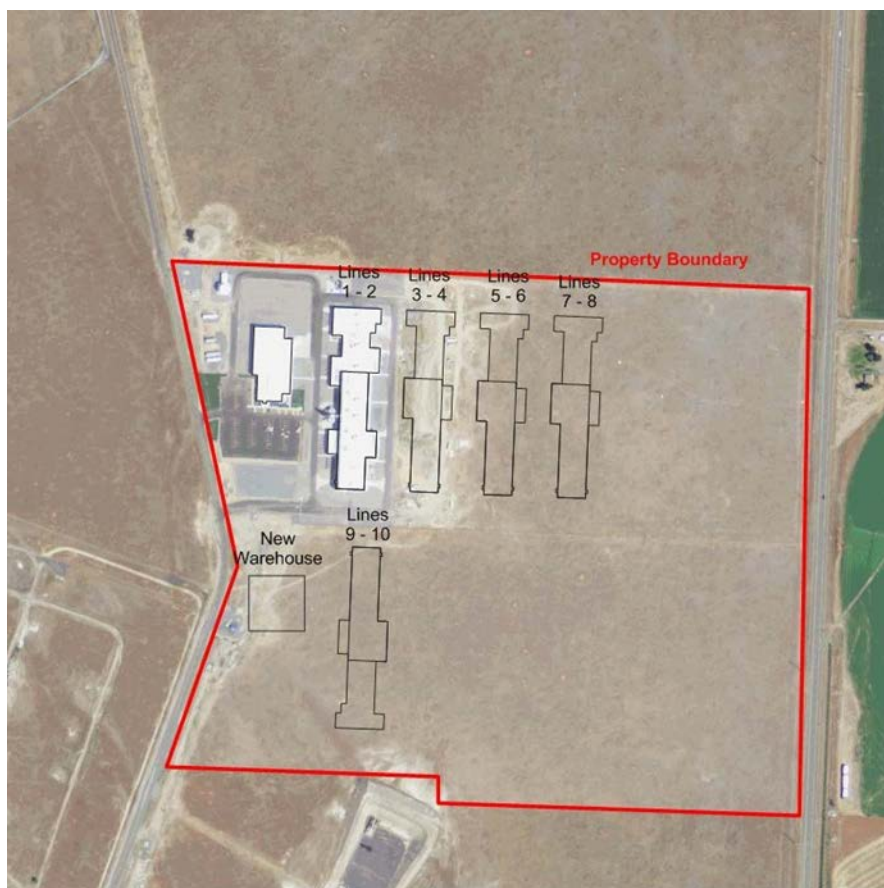


Figure 1: Facility map



### **3.2. The existing facility**

On March 23, 2010, SGL applied to install and operate two polyacrylonitrile carbon fiber production lines. Each line had the capacity to produce up to 1,500 tons of carbon fiber per year. In order to stay below 100 tons per year (tpy) limit, SGL requested and received a federally enforceable limit of 99 tpy on nitrogen oxides (NO<sub>x</sub>). Permit No. 10AQ-E362 was issued on July 13, 2010.

On January 31, 2011, SGL applied to install seven natural gas-fired reciprocating engines. Six of the engines were intended to provide power to safely shut down Line 1 should a grid power failure occur. The seventh engine was to provide power to an emergency power water pump for fire suppression. Permit No. 10AQ-E362 was rescinded and replaced by 11AQE408 on April 14, 2011.

On July 25, 2012, SGL applied to install and operate four natural gas-fired emergency power reciprocating engines. These engines were installed to provide emergency backup power to safely shut down Line 2. Permit No. 11AQ-E408 was rescinded and replaced by Permit No. 12AQ-E465 on February 21, 2013.

On June 28, 2013, SGL applied to double the size of the facility from two lines to four lines. Each of the four lines is designed to produce up to 1,760 tons of carbon fiber per year. In order to stay below the 100 tpy limit, SGL installed controls to ensure nitrogen oxides (NO<sub>x</sub>) emissions would not exceed 100 tpy thus meeting their federally enforceable limit of 99 tpy on NO<sub>x</sub> in the original permit. Permit No. 12AQ-E465 was rescinded and replaced by Permit No. 13AQ-E525 on January 24, 2014.

On March 26, 2014, SGL applied to change the emergency backup power for Lines 3 and 4 allowed in Permit No. 13AQ-E525 from natural gas internal combustion engines to diesel compression ignition engines. Permit No. 14AQ-E558 was issued on September 9, 2014.

On March 4, 2014, SGL submitted an application to increase the size of the facility from four lines to eight lines. The proposed Lines 5–8 Project was identical to Lines 1–4 Project authorized by Permit No. 13AQ-E525 with three exceptions. SGL proposed to generate backup emergency power from diesel engines instead of natural gas engines, furnace emissions are no longer routed through a selective catalytic reduction (SCR) control device due to plugging problems, and a new mode of operation (Standby Mode) has been requested. The furnace emissions are still routed through a thermal oxidizer (TO), but water injection is proposed to reduce the formation of NO<sub>x</sub>. During the public comment period for the preliminary Order of Approval, the U.S. Environmental Protection Agency (EPA) expressed its position that the approval process for Lines 5–8 should have been aggregated with the existing Approval Order. Under the terms of Settlement Agreement and Agreed Order No. 10768 signed June 16, 2014, Ecology acknowledged that Lines 1 and 2 were appropriately permitted as minor sources, and SGL agreed to submit new minor and major source permit applications addressing Lines 3–8, and the Lines 5–8 Project was never approved.

On August 15, 2014, SGL applied to increase the size of the facility to 10 lines. Each of the additional lines is expected to produce 1,760 tons of carbon fiber each year and include a regenerative thermal oxidizer (RTO) and a TO to combust organic compounds in the exhaust

from the oxidation ovens and carbonization furnaces, respectively. An SCR will be installed on Lines 3–6 but is not proposed for Lines 7–10. Additionally, eight diesel-fueled backup emergency power generators and a firewater pump engine will be installed.

There are seven process steps associated with producing carbon fiber. They are:

1. Feed and Pretension: This step involves feeding carbon fibers from spools or bobbins through a series of rollers to apply uniform tension. There are no measurable emissions from the feed and pretension phase of production.
2. Oxidation: This step involves heating the fibers in electrically powered ovens up to a temperature of 200 to 300 degrees Celsius (°C). SGL indicated that it usually takes between four and five hours to complete the oxidization phase. Each line has four electrically powered ovens with two zones each.
3. Low-Temperature Carbonization: Each line has two electrically powered furnaces: one for low-temperature carbonization and one for high-temperature carbonization. Carbonization is the conversion of an organic substance into carbon. The fiber is fed into a furnace and heated to temperatures between 700° and 800°C in a nitrogen atmosphere. The material loses approximately 39 percent of its weight during this phase.
4. High-Temperature Carbonization: The fiber is then fed into a second furnace and is heated to temperatures between 1200° and 1300°C in a nitrogen atmosphere. When the fiber leaves this furnace, it has a carbon content of approximately 94 percent and is 10 to 12 percent lighter.
5. Surface Treatment: In this step, the surface of the fiber is treated by passing electricity through it. The fiber is treated as an anode in an electric cell, which allows material to be bonded to the outside of the fiber. There are no measurable emissions from the sizing phase of production.
6. Sizing: A resin sizing coating is applied using a double-dip roller bath and squeegee. The fiber is treated with resin to improve handling and transportation and then dried by two steam drum rollers. There are no measurable emissions from the sizing phase of production.
7. Winding and Packaging: During this step, the finished carbon fiber is wound around cardboard spools and shrink-wrapped for shipment. There are no measurable emissions from the winding and packaging phase of production.

### 3.3. The proposed action

Ecology is proposing to grant an 18-month time extension to the PSD permit.

## **4. Laws and Rules**

Washington State operates its PSD program under a State Implementation Plan (SIP) approved by EPA. Ecology has its own PSD program codified in WAC 173-400-700 through 750. Ecology follows all EPA guidance and Ecology's own PSD guidance document when issuing PSD permits.

The Washington State Clean Air Act codified in Chapter 70.94 Revised Code of Washington grants Ecology the authority to issue NSR Orders of Approval. The implementing regulation, Chapter 173-400 WAC, describes a set of procedures to use when performing NSR. The majority of the requirements are contained in, but not limited to, WAC 173-400-091, WAC 173-400-110, WAC 173-400-111, WAC 173-400-113, and WAC 173-400-114. There are several general requirements or emission standards that apply to this source. One emission standard is a grain loading standard from combustion units of 0.1 grains/dry standard cubic foot (g/dscf) (see WAC 173-400-050(1)). There is also a maximum opacity standard of 20 percent listed in WAC 173-400-040(1).

### **4.1. WAC 173-400-110**

This section of the rule addresses applicability of NSR to new and modified sources. Lines 3–10 are new emission units and this section of the rule describes the procedures for processing a Notice of Construction application.

### **4.2. WAC 173-400-113**

This section of the rule requires a proposed source of modification in an attainment or unclassifiable area to comply with the federal rules, employ BACT for new or modified units, and ensure that the project does not cause or contribute to a violation of ambient air quality standards.

## 5. Emissions

### 5.1. Operational limitations

SGL has estimated its operational hours in each mode. Those limits are:

- RTO Bypass Mode limited to aggregate 1½ hr/day for Lines 3–10 and 4½ hr/line/yr.
- Shutdown Mode will be limited to 365 ninety-second events per year for a total of 9.13 hours for each line.
- SCR Bypass Mode limited to 100 hr/yr for each line.
- Operation of the eight 2,937 bhp emergency generators is limited to aggregate 136 hours of operation per year. The 136 hours of operation is expected to consist of eight hours of maintenance and testing and eight hours of emergency operation, per engine, as well as an additional eight hr/yr for performance/source testing of one representative engine. The approval however will not restrict how the engines are operated only the total hours of operation.
- Operation of the firewater pump engine is limited to 38 hr/yr. Originally, there was a plan to use 30 hours for maintenance and testing and eight hr/yr for emergency operation, but there will be no restriction on how the firewater pump engine is operated, just the total hours of operation.

### 5.2. The application

The application/request for the time extension was received by Ecology on February 2, 2018. This TSD and time extension amendment is based upon the information submitted by the applicant, SGL.

### 5.3. Hazardous air pollutants

Emissions of hydrogen cyanide exceed the 10 tpy major source threshold, which requires a facility-wide air operating permit. The emissions are greater than the exemptions contained in WAC 173-400110(4) or (5) for most pollutants and the emission units themselves are not on the categorical exemption list.

### 5.4. PSD

SGL is a source that must evaluate PSD applicability based on the emissions threshold of 100 tpy or more of a regulated pollutant rather than 250 tpy or more of a regulated pollutant. It is subject to PSD because:

- SGL is one of the 28-listed industries that become a “major stationary source” when emitting more than 100 tpy of any regulated pollutant. If any one pollutant were emitted in quantities greater than 100 tpy, the project would be subject to PSD review.
- Proposed emissions of NO<sub>x</sub> from the stationary source are greater than 100 tpy.
- Proposed emissions of PM, PM<sub>10</sub>, NO<sub>x</sub>, and VOC, exceed the PSD SER of 25, 15, 40, 40, and 40 tpy, respectively.
- In the June 16, 2014, Settlement Agreement, SGL agreed to apply for a PSD permit for Lines 3–8.
- The site of the proposed project is in an area that has been designated as in attainment or unclassifiable with national and state ambient air quality standards.

## **6. Conclusion**

The time extension will have no significant adverse impact on air quality. The Washington Department of Ecology finds that the applicant, SGL, has satisfied all requirements for NSR.

## **7. Public Comment Period**

This PSD permitting action is subject to a minimum 30-day public comment period under WAC 173-400-740. A newspaper public notice announcing the public comment period was published in the Columbia Basin Herald on November 14, 2018. The public comment period ran from November 14, 2018, through to 5 P.M. PST on December 13, 2018. No comments were submitted. In accordance with WAC 173-400-740(2)(a), application materials, and other related information were made available for public inspection at:

Moses Lake Public Library  
418 East Fifth Avenue  
Moses Lake, WA 98837  
509-765-3489

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## 8. Agency Contact

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## **9. List of Acronyms and Abbreviations**

°C	degrees Celsius
BACT	Best Available Control Technology
bhp	brake horsepower
Ecology	Washington Department of Ecology
EPA	United States Environmental Protection Agency
g/dscf	grains per dry standard cubic foot
HAP	hazardous air pollutant
hr	hour(s)
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO <sub>x</sub>	nitrogen oxides
NSR	New Source Review
PM	particulate matter
PM <sub>10</sub>	particulate matter smaller than 10 microns in diameter
PM <sub>2.5</sub>	particulate matter smaller than 2.5 microns in diameter
PSD	Prevention of Significant Deterioration
RTO	regenerative thermal oxidizer
SCR	selective catalytic reduction
tpy	tons per year
VOC	volatile organic compound
WAC	Washington Administrative Code